



**Montgomery County
Department of Transportation**

Midcounty Highway Noise Study

**From Montgomery Village Avenue
to Shady Grove Road**

Please Hold Questions

We will answer all questions at
the end of the presentation.

WHO ARE WE?

Department of Transportation



Division of Transportation Engineering

Bruce Johnston

Sogand Seirafi

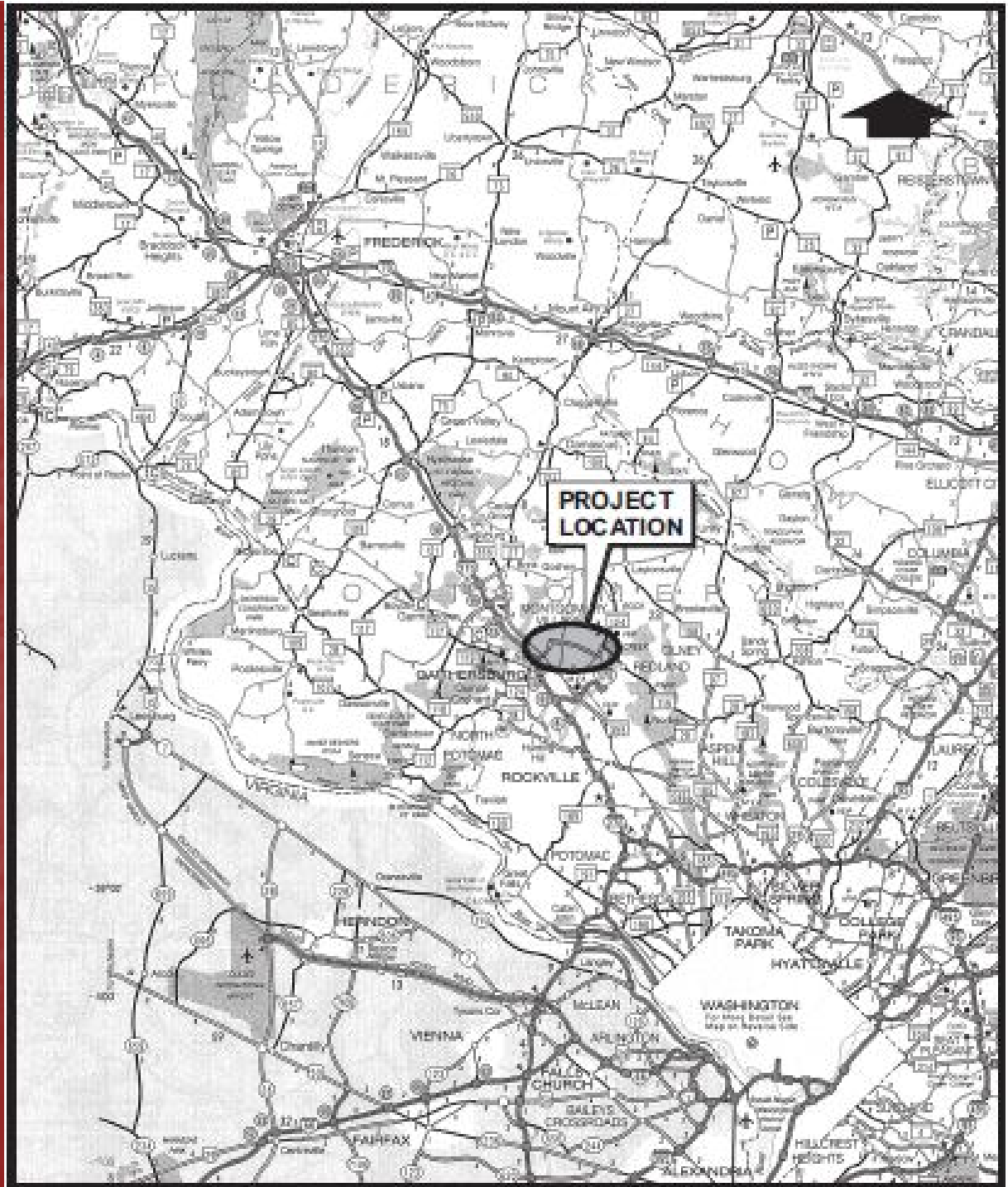
Michael Mitchell (Program Manager)

PURPOSE OF THIS MEETING ?

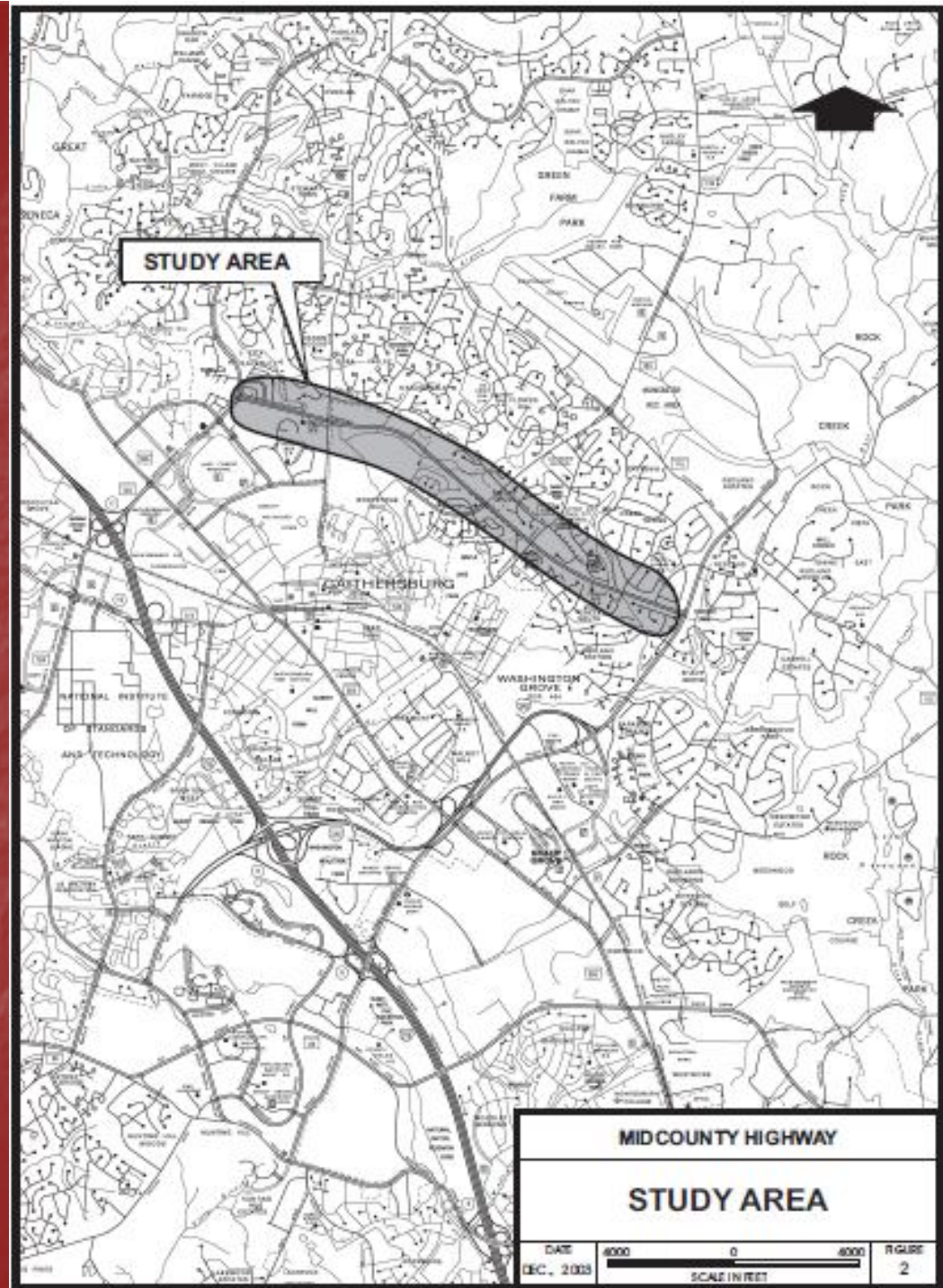


- ✦ Present the results of the noise study.
- ✦ Answer Community's questions.
- ✦ Receive feedback from the public on the findings of the study.

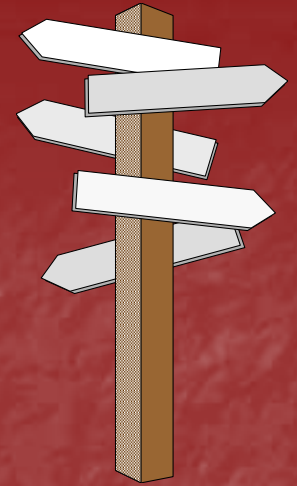
Vicinity Map



STUDY AREA



Project Need:



- ✦ This project is a study to assess noise levels generated by road traffic only.
- ✦ The study determines the need, qualification and feasibility of noise mitigation measures.

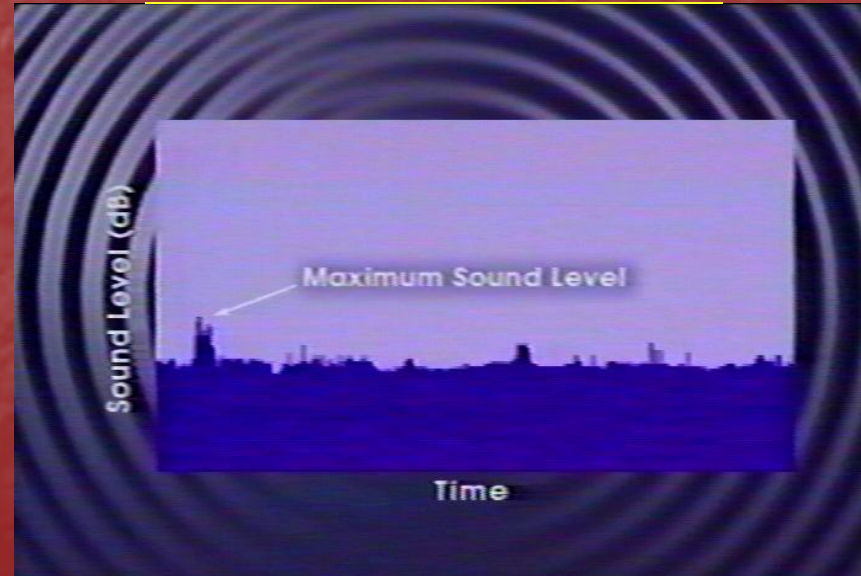
Noise Fundamentals

- Two short videos on fundamentals of quantifying and measuring highway noise and designing barriers.

Noise Fundamentals 1



Noise Fundamentals 2



Noise Fundamentals

- Concerned with traffic noise (trucks, cars, buses, and motorcycles). Noise is generated by the stack, engine, and tires and increases with speed and volumes.
- Background noise (rustling leaves, aircraft, children playing, insects, etc.)
- Unit of noise measurement is DECIBEL, a logarithmic scale based on energy.
- A doubling of sound energy, as would be a doubling of traffic volume, would be 3 dBA change.
- Human Hearing ability affects how noise is heard.
 - 3 dBA change generally perceptible
 - 5 dBA change readily noticeable
 - 10 dBA change 'sounds' twice as loud to most people

Study Criteria

- The Noise Study was done as per the County's Highway Noise Abatement Policy

The County's noise study criteria is very similar to noise study criteria used by the Federal government and other state governments

- Noise Measurements are taken at outdoor ground level (i.e. rear useable yard) 25 feet from the house, five feet above ground (approx. human ear level).

Typically the noise inside the dwelling is 15 to 20 dBA below that outside the dwelling

Methodology

How The Study Was Conducted

- **Logical Implementation Segments (LIS)**

LIS is a Logical assessment area that has similar noise characteristics. An LIS is generally selected such that protection would be provided by an individual noise barrier wall.

- **Receptor Locations**

Receptor locations selected to accurately show noise levels within each LIS.

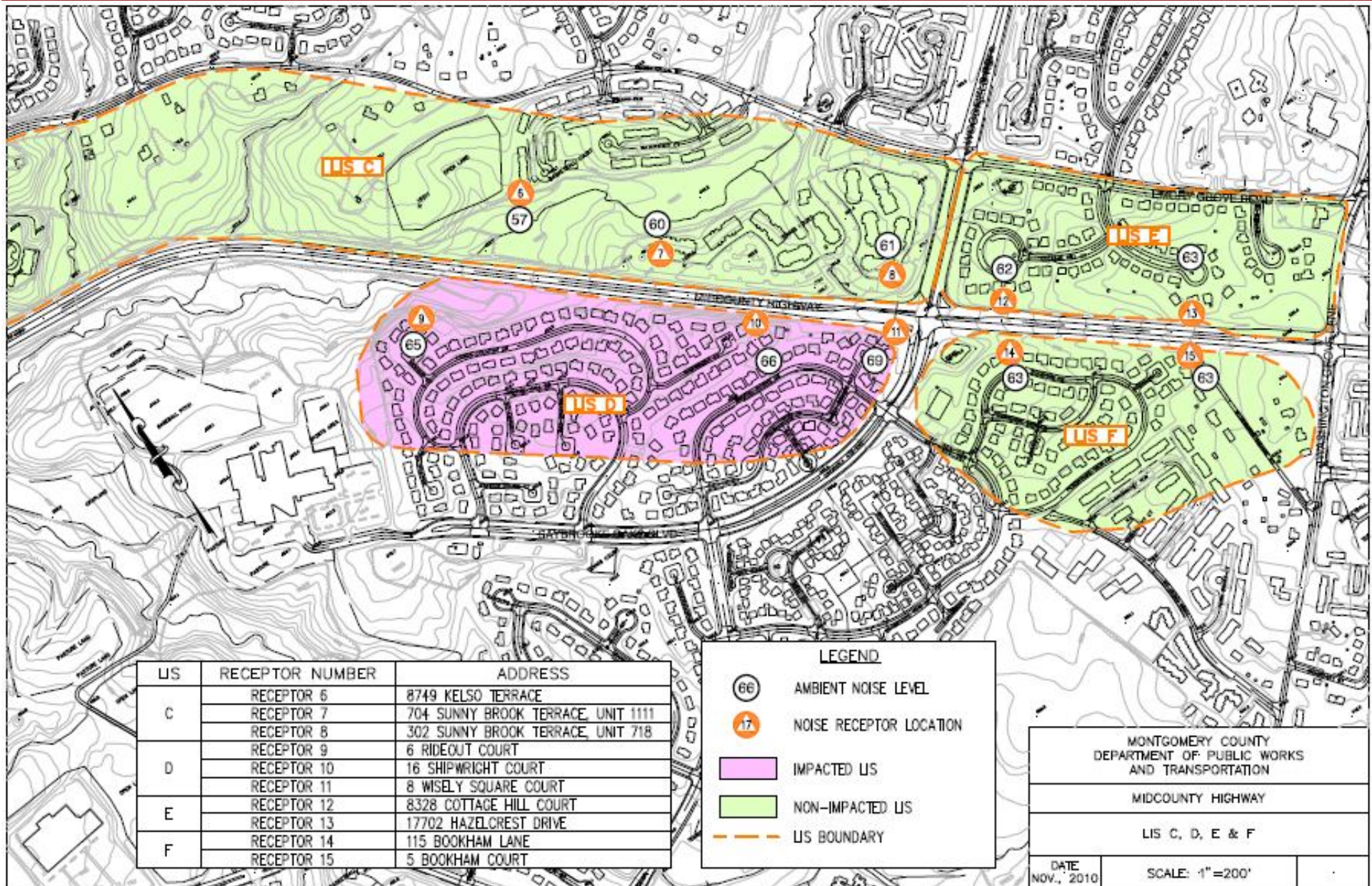
- **Scope of Study (Noise Measurements & Modeling)**

Investigate current noise levels as well as noise levels projected to occur within the next 20 years (at Level of Service 'D')

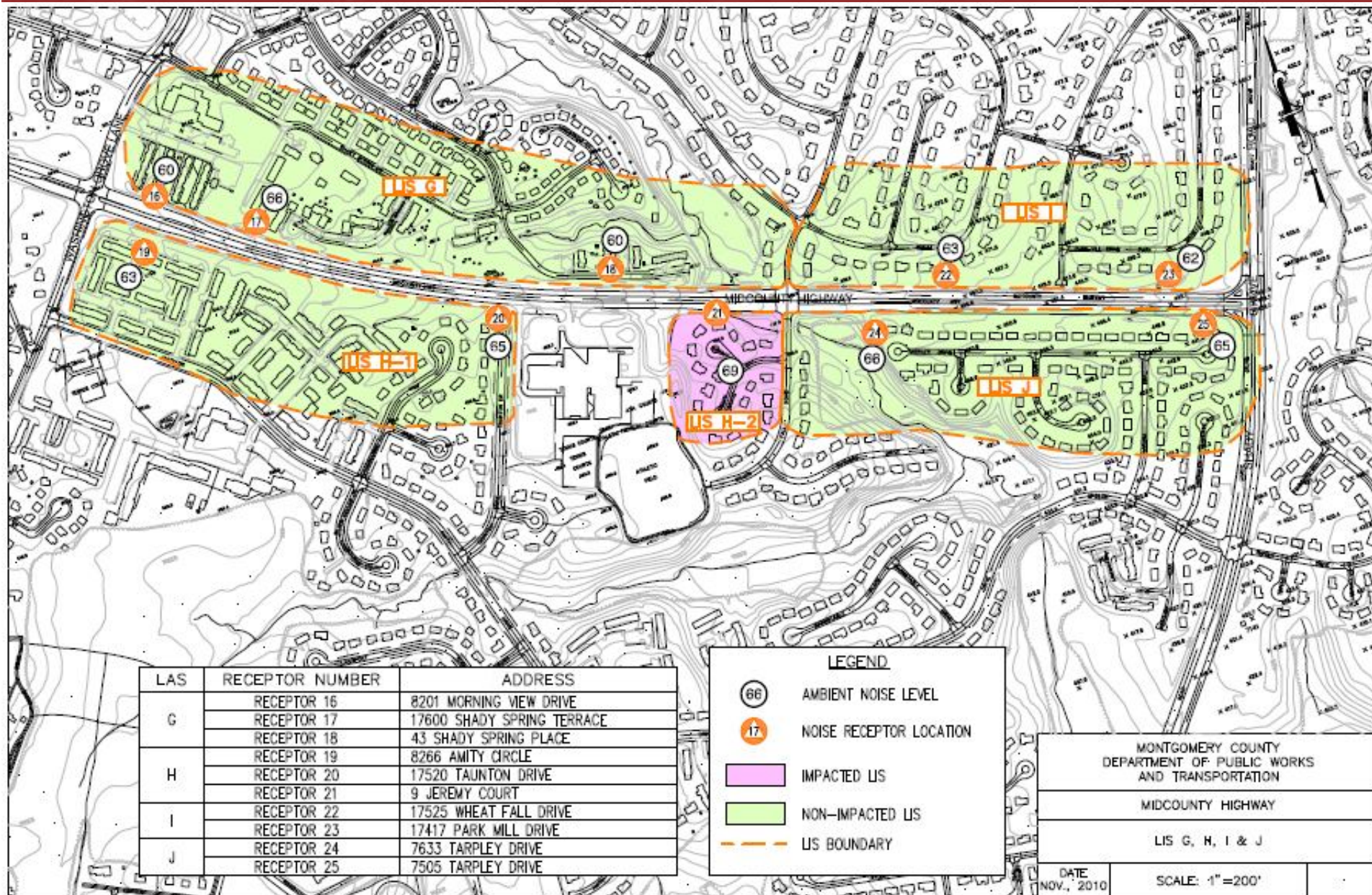
LIS Map



LIS Map continued



LIS Map continued



Terms (More Fundamentals)

- Impacted: A receptor experiencing a peak-noise hour equivalent sound level of 67 dBA or higher due to vehicular traffic noise.
- Affected (By Construction): Properties on which the implementation of the noise mitigation measures created temporary or permanent property impacts.
- Benefited: Receptors (or homeowners) which are noise impacted and experience barrier insertion loss of at least 3 dBA.
- Insertion Loss: The decrease in the sound level measured at a receptor location when a noise barrier is placed in the noise propagation path between the receptor and a roadway
- Level of Service (LOS-D): A qualitative measure of traffic flow conditions (primarily traffic volume and average speed), differentiated into six levels and given letter designations ('A' through 'F') where 'A' represents the best operating conditions (low volume/high speed) and 'F' the worst. The greatest noise generation from a roadway generally occurs at LOS-D, characterized by high traffic density with stable, high speeds.

LIS Descriptions

LIS	Description	No. of Residences	No. of Receptor Sites
A	Single-family and multi-family residences along north side of Midcounty Hwy between Montgomery Village Avenue and Goshen Road.	380	2
B	Multi-family apartments and townhouses along south side of Midcounty Hwy between Montgomery Village Avenue and Goshen Road.	326	2
C	Single family and multi-family residences along north side of Midcounty Hwy between Goshen Rd and Woodfield Rd.	205	4
D	Single family residences along residences along south side of Midcounty Hwy between Goshen Rd & Saybrooke Oaks Blvd	155	3
E	Single family residences along north side of Midcounty Hwy between Woodfield Rd and Washington Grove Ln.	68	2

LIS Descriptions continued

LIS	Description	No. of Residences	No. of Receptor Sites
F	Single family residences along south side of Midcounty Hwy between Saybrooke Oaks Blvd and Washington Grove Ln.	70	2
G	Multi-family townhouses along north side of Midcounty Hwy between Washington Grove Ln and Miller Fall Rd.	225	2
H	Single family, multi-family residences, and a school along south side of Midcounty Hwy between Washington Grove Ln and Miller Fall Rd.	196	3
I	Single family residences along north side of Midcounty Hwy between Miller Fall Road and Shady Grove Road	59	2
J	Single family residences along south side of Midcounty Hwy between Miller Fall Road and Shady Grove Road	88	2

Scope of Noise Study

1. Review study area and select LIS and receptor sites.
2. Take short term (20 minute) and long term (24 hour) noise measurements.
 - * Traffic counts taken with short term measurements. Noise measurements and traffic counts used to calibrate computer model used for acoustical analysis
 - * 24-hour noise measurements used to determine sound variations over a day and to determine noisiest hours
3. Set up and calibrate computer model used to determine noise levels in the future design year. Transportation Noise Model (TNM) of Federal Highway Administration used to model noise levels. Input includes traffic types, volumes and speeds; locations and types of roadways and receivers; intervening objects that would affect the noise levels such as buildings, trees, ground, and grass.

Scope of Noise Study continued

5. Run calibrated model based on projected traffic levels expected to occur within 20 years (use LOS-D traffic volume if expected to occur within 20 years). Where noise levels exceed 67 dBA analyze barriers.
6. Input proposed barrier locations, lengths and heights into TNM computer program.
7. Vary barrier heights as required until desired noise reduction is obtained.
8. Estimate cost and perform cost/benefit analysis
9. Prepare report

Ambient Noise Measurements

LIS	Receiver	Location	Description	Adjusted Ambient (dBA)
A	R1	2 Docena Court	Apartment	61
	R2	18503 Locust Point Ct	Townhouses	60
B	R3	18351 Lost Knife Circle	Apartment	66
	R4	18206 Willow Creek Way	Townhouses	59
C	R5	137 Emory Woods Court	Townhouses	65
	R6	8749 Kelso Terrace	Townhouses	57
	R7	704 Sunny Brook Ter #1111	Townhouses	60
	R8	302 Sunny Brook Ter #718	Townhouses	61

Note: Adjusted ambient is peak ambient noise level to be expected during a 24-hour period.

Ambient Noise Measurements continued

LIS	Receiver	Location	Description	Adjusted Ambient (dBA)
D	R9	6 Rideout Court	Residence	65
	R10	16 Shipwright Court	Residence	66
	R11	8 Wisely Square Court	Residence	69
E	R12	8328 Cottage Hill Ct	Residence	62
	R13	17702 Hazelcrest Dr	Residence	63
F	R14	115 Bookham Lane	Residence	63
	R15	5 Bookham Court	Residence	63
G	R16	8201 Morning View Dr	Townhouse	60
	R17	17600 Shady Spring Tr	Townhouse	66
	R18	43 Shady Spring Pl	Townhouse	60

Note: Adjusted ambient is peak ambient noise level to be expected during a 24-hour period.

Ambient Noise Measurements continued

LIS	Receiver	Location	Description	Adjusted Ambient (dBA)
H	R19	8266 Amity Circle	Townhouse	63
	R20	17520 Taunton Drive	Residence	65
	R21	9 Jeremy Court	Residence	69
I	R22	17525 Wheat Fall Dr	Residence	63
	R23	17417 Park Mill Drive	Residence	62
J	R24	7633 Tarpley Drive	Residence	66
	R25	7505 Tarpley Drive	Residence	62

Note: Adjusted ambient is peak ambient noise level to be expected during a 24-hour period.

Noise Mitigation Criteria

Feasibility Criteria

- The barrier can be built to provide an insertion loss of at least 7 dBA for the most seriously traffic-noise impacted receptors.
- The barrier can be built without either unduly restricting pedestrian or vehicular access, or without interfering with safe sight distances for motorists.
- Any right-of-way required for the construction and maintenance of the barrier must either be dedicated to the County at no cost or the County is granted permanent easement.

Noise Mitigation Criteria continued

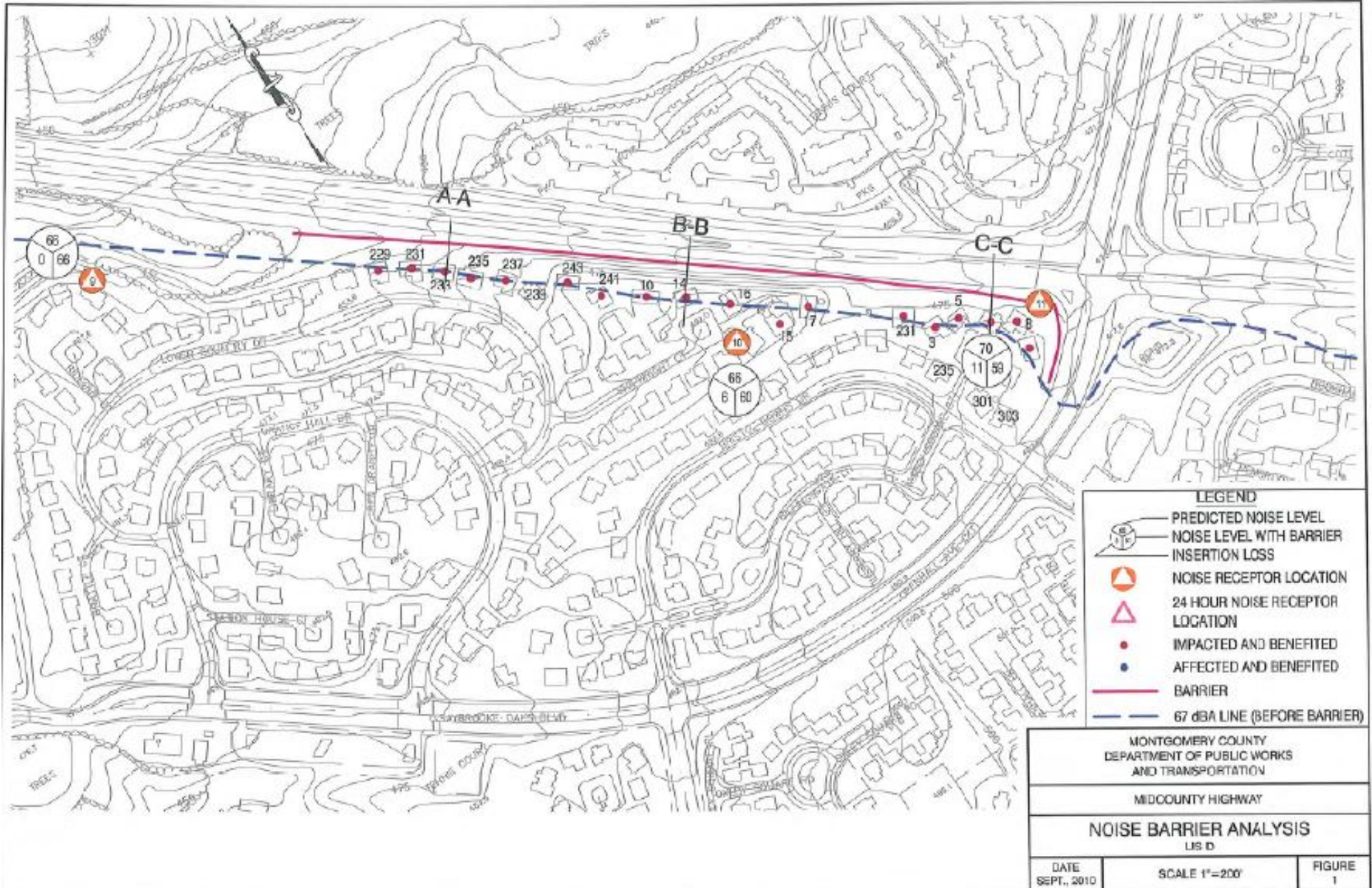
Reasonableness Criteria

- The measured or projected sound level must equal or exceed 67 dBA.
- The barrier will not result in undue negative impacts on the environment or historical resources.
- The County costs to install the barrier will not exceed \$100,000* per benefited receptor (where benefited receptors are considered to be the owners of those dwellings which are impacted or affected by construction and will enjoy a barrier loss of at least 3 dBA).
- * If homes are built AFTER the approved Master Plan for the subject area, the home owner is required to pay 10% of cost of barrier up to the first \$100,000.
- The barrier designs and payment responsibility, if any, are approved by the benefited property owners.

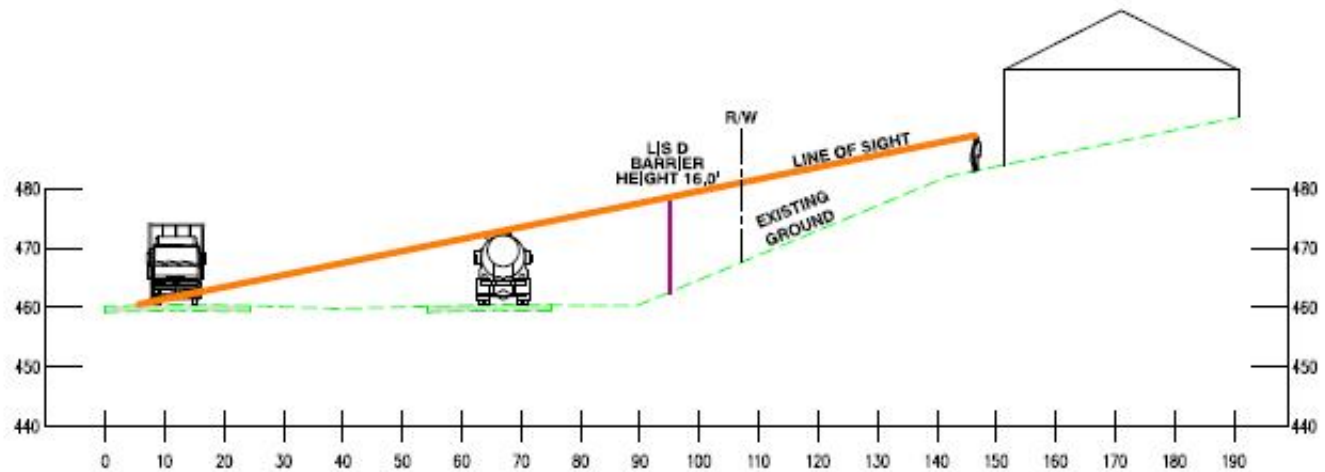
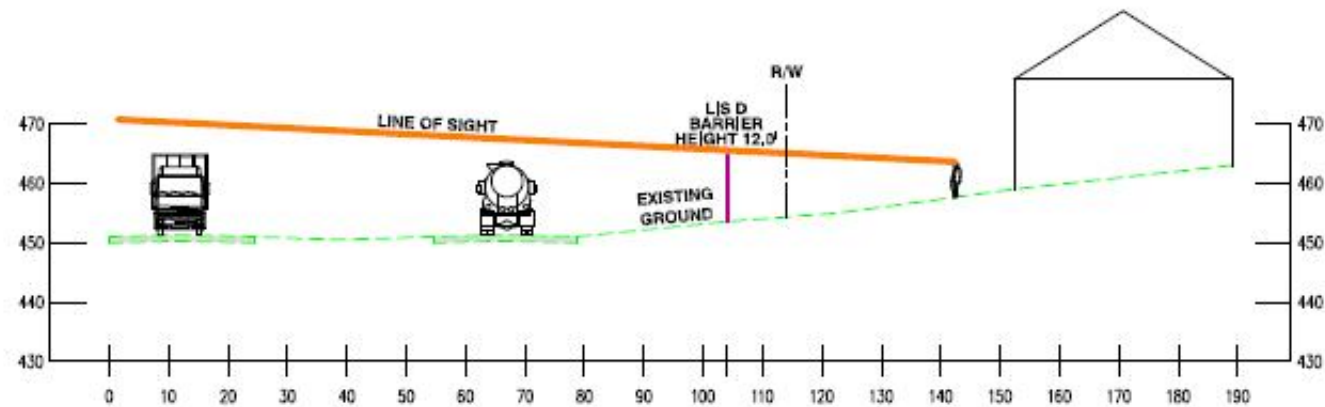
Summary of Results

1. Only two LISs, LIS 'D' and 'H,' fully meet County's criteria for noise mitigation. Current ambient noise level exceeds 67 dBA at these locations.
2. For LIS 'D' the cost per Affected and Benefited residence is \$139,444. A noise barrier could be built if the impacted residents fund the additional costs over \$90,000* (i.e. \$49,444 each).
3. For LIS 'H' the cost per Affected and Benefited residence is \$136,832. A noise barrier could be built if the impacted residents fund the additional costs over \$90,000* (i.e. \$46,832 each).

LIS 'D' with proposed barrier



LIS 'D' proposed typical sections



MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS
AND TRANSPORTATION

MIDCOUNTRY HIGHWAY

NOISE ABATEMENT BARRIER LIS D

DATE
SEPT., 2010

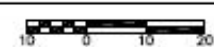
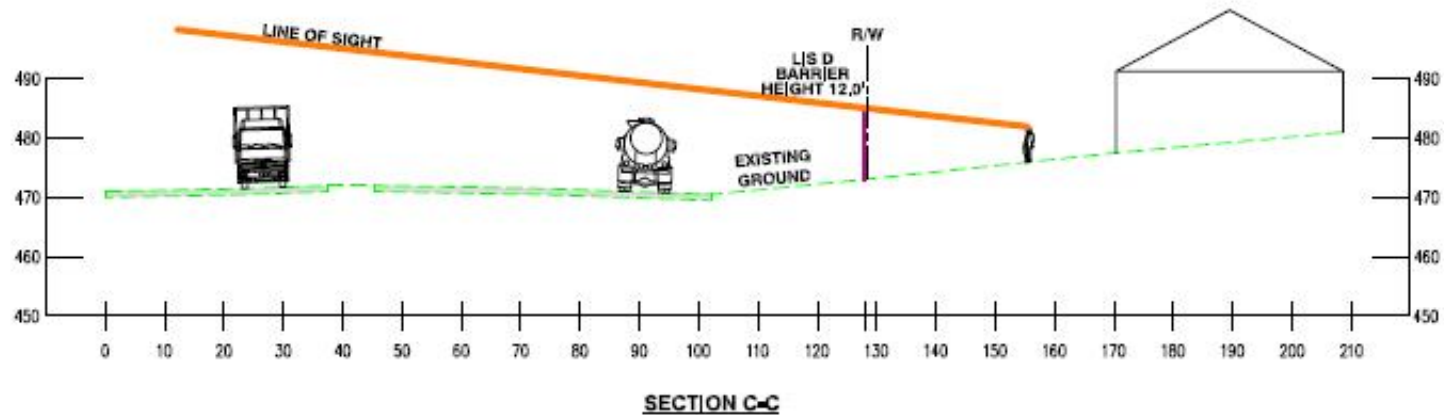



FIGURE
2

LIS 'D' proposed typical sections

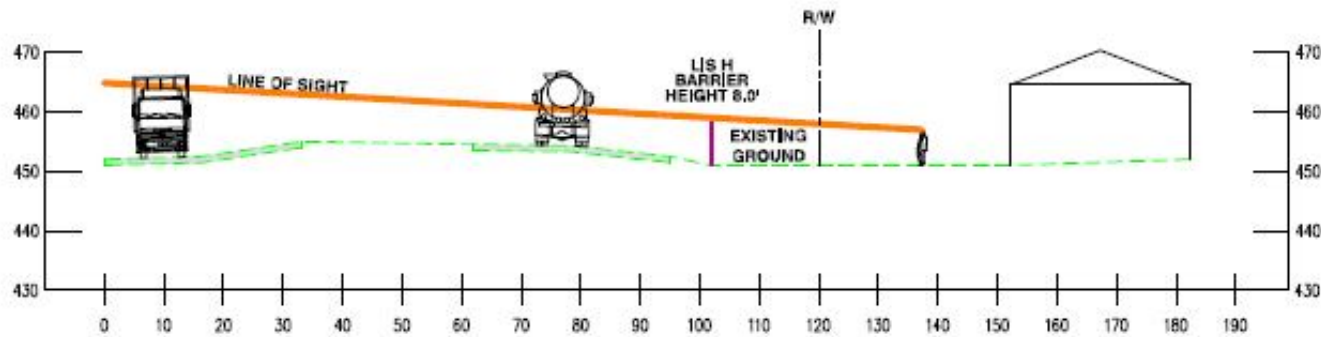


MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION		
MIDCOUNTRY HIGHWAY		
NOISE ABATEMENT BARRIER LIS D		
DATE SEPT., 2010		FIGURE 3

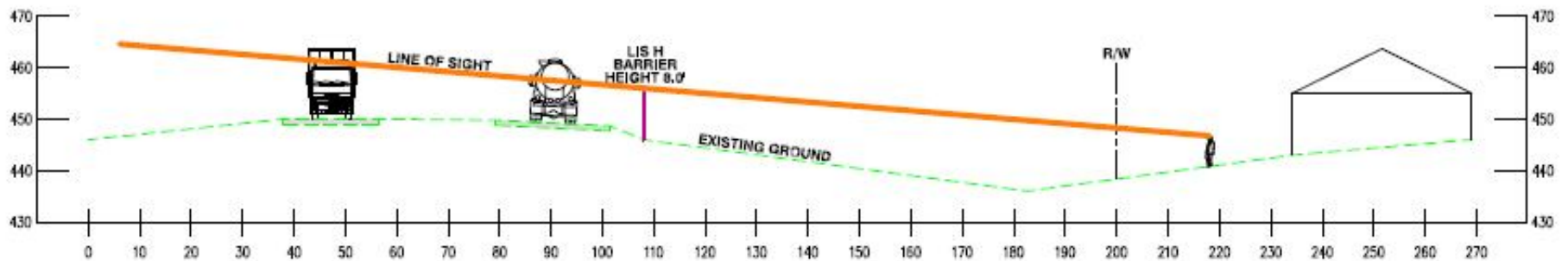
LIS 'H' with proposed barrier



LIS 'H' proposed typical sections



SECTION D-D



SECTION E-E

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS
AND TRANSPORTATION

MIDCOUNTY HIGHWAY

NOISE ABATEMENT BARRIER LIS H

DATE
SEPT., 2010



FIGURE
5

Rankings & Funding Priority

The “Score”

$$S = NIP + TLOSD + HCD + HPD + NBH + CBH + EOB$$

- MC-DOT provides County Council with rankings of eligible communities biennially
- Council selects which LISs will be funded for mitigation

Rankings

Ranking of Feasible and Reasonable Noise Wall Candidates					
					Estimated
Current Rank	Score	Road	Segment (LIS: Logical Implementation Segments)	Est S.F.	Total Cost
1	72.0	Middlebrook Road-E of I270	LIS 1: Twinflower Circle	24,610	\$2,337,950
2	45.0	Shady Grove Road-North	LIS 8A: East side, Tupelo Drive to "Mid County Hwy"	1,335	\$126,825
3	35.0	E. Randolph Road	LIS 3: south side, Tamarack Rd to Billington Rd	9,971	\$947,245
4	32.0	Shady Grove Road-North	LIS 7A: east side, Briardale Rd to ICC right-of-way	4,366	\$414,770
5	31.5	E. Randolph Road	LIS 12A: north side, Appleby Dr to Partridge Dr	8,381	\$796,195
6	29.5	E. Randolph Road	LIS 4A: south side, Billington Rd to Laurie Dr	7,842	\$744,990
7	28.0	E. Randolph Road	LIS 1: south side, Burkhart St to Broadmore Rd	5,102	\$484,690
8	27.5	E. Randolph Road	LIS 7A: south side of Tufa Terrace	3,177	\$301,815
9	27.0	Shady Grove Road-North	LIS 9: east side, Mill Run Drive to Muncaster Mill Rd	7,040	\$668,800
10	26.5	E. Randolph Road	LIS 9: north side, east of Tamarack Road	19,380	\$1,841,100
11	23.5	E. Randolph Road	LIS 10: north side, Tamarack Rd to Smith Village Rd	11,966	\$1,136,770
11	23.5	Middlebrook Road	LIS 5: north side, near Ridgecrest Drive	1,564	\$148,580
13	23.0	Midcounty Highway	LIS D: south side, For. Oak MS to Saybr. Oaks Blvd	26,421	\$2,509,995
14	20.5	Middlebrook Road	LIS 2: south side, Ridgecrest Dr to Waring Sta. Rd	4,735	\$449,825
15	17.5	E. Randolph Road	LIS 11: north side, Smith Village Rd to Appleby Dr	7,975	\$757,625
16	17.0	Shady Grove Road-North	LIS 5: West side, Mill Run Drive to Munaster Mill Rd	9,452	\$897,940
16	17.0	E. Randolph Road	LIS 6: north side, Serpentine Way to Sandstone Ct	4,565	\$433,675
18	16.5	Shady Grove Road-North	LIS 8B: East side, "Mid County Hwy" to Mill Run Drive	3,329	\$316,255
19	16.0	E. Randolph Road	LIS 12B: north side, Partridge Dr to Burkhart St	2,137	\$203,015
19	16.0	E. Randolph Road	LIS 4B: south side, East Side of Laurie Dr	1,785	\$169,575
21	15.5	Middlebrook Road	LIS 3: south side, Waring Sta. Rd to I-270 on-ramp	4,675	\$444,125
22	15.0	E. Randolph Road	LIS 7B: north side, Tourmaline Ct & Aventurine Way	4,613	\$438,235
23	14.0	Shady Grove Road-North	LIS 7B: East side, ICC right-of-way to Tupelo Drive	1,538	\$146,110
24	12.0	Shady Grove Road-North	LIS 4: West side, Mid County Hwy to Mill Run Drive	7,796	\$740,620
25	11.5	Middlebrook Road	LIS 4: south side, at I-270 on-ramp	3,107	\$295,165
26	11.0	E. Randolph Road	LIS 5: north side, Old Columbia Pike to Serpentine Way	4,714	\$447,830
27	10.5	Middlebrook Road	LIS 1A: west of Ridgecrest Drive	2,351	\$223,345
28	6.5	Shady Grove Road-South	LIS E: east side, Sweetwood Ave to Shinning Willow Dr	6,456	\$613,320
29	5.5	Midcounty Highway	LIS H-2: south side, Miller Fall Rd to Wash. Grove La	4,321	\$410,495
29	5.5	Shady Grove Road-South	LIS B: west side at Procera Drive	5,580	\$530,100

Your Choices

1. Mitigation (Noise Barrier): agree to the co-pay amount and provide fee simple property or easement to build barrier, where necessary. 60% of the each LIS community has to agree. 100% of property owners from whom property is needed have to agree.

If an LIS community rejects a barrier, it has to wait at least six 6 years before requesting reconsideration for barriers.

2. Non-Mitigating measures (fences or vegetative landscaping): will not reduce the noise impact, but provide visualize obstruction of the road and give the *perception* that traffic noise is less objectionable.

If an LIS community requests non-mitigating measures, it has to wait 12 years before requesting consideration for mitigation (barriers).

Next Steps:

- ⚙ Get Community Input
- ⚙ Conduct Survey (Voting) for LIS 'D' and 'H'
- ⚙ Present the Study and the “Voting” results to the County Council along with results of studies/voting for other locations around the County
- ⚙ County Council will decide which locations will be funded for Final Design and Construction

QUESTIONS?